2	"	3:1	"	2.0
3	"	4:1	"	1.8
4	"	5:1	"	1.7
5	"	6:1	"	1.6
6	"	7:1	"	1.6

The useful surface of the optical plate is given by R_1 or a radius slightly different.

2. Magnitude of the deformations

Assuming E is Young's modulus of the optical plate to be formed and the origin of the deformations is in the Kerber zone, W_{max} is the deflection at the center of the refractive plate the thickness h of the plate must be chosen according to the following equation:

$$h = \sqrt[3]{(P_o/E)\,(R^4/W_{max})\cdot Y_{Kerber}\,(Q_2/Q_1)}$$

The function Y_{Kerber} (Q_2/Q_1) is a value without dimension which is also an object of the present invention.

The values of this function are those indicated in the ranges of the following table:

1	≤	Q_2/Q_1	≤	2:0.02	≤ YKerber ≤	0.20
2		"		3:0.02		0.14
3		"		4:0.02	"	0.10
4		"		5:0.01	"	0.07
5		"		6:0.01	"	0.06
6		"		7:0.01	"	0.05

By way of example it can be specified that a Schmidt-Kerber optical element produced according to the method of the invention and deformed on its two faces BSC B 16.64 has the following characteristics:

Useful diameter	$2R_1$ = 245 mm.
	$2R_2$ = 295 mm.
	Q_1 = 6
	Q_2 = 1
	P_o = 1 atmosphere
	h = 4.10 mm.

and the magnitude of the deformations correct the aberrations of the spherical mirror opened to $f/1.50$.

It does not seem possible that the Schmidt method with a single vacuum zone could have produced compensating or corrective optical element of this dimension.

The method according to the invention enables the economical manufacture of any mirror, lens or other optical element for correcting or compensating for all or part of the aberrations of an optical system such as a photographic lens system, cinemagraphic lens system, Gauss monochromatic lenses, telescopic lenses, lenses for spectrographic chambers, telephoto lenses, camera lenses or the like.

The method is of great interest in the optical industry in general and in particular for uses with regard to astronomy.

What we claim is:

1. A device for producing a circular aspherical optical element by pneumatic deformation of a planar circular optical plate, comprising:

a. a circular chamber of a depth greater than the thickness of said plate;

b. means for sealing the periphery of said plate against the circumference of said circular chamber;

c. an annular sealing support for said plate, dividing said circular chamber into a central circular chamber and an annular chamber concentric with said central circular chamber, said support serving to seal said last named chambers from each other, and

d. means for reducing the pressure in said central circular chamber and in said annular chamber independently of each other and to different degrees.

2. A device as claimed in claim **1**, wherein the said annular sealing support is at least one toroidal sealing element.

3. A device as claimed in claim **2**, wherein another toroidal sealing element is arranged about the periphery of the plate, the annular chamber therefore being delimited by the toroidal sealing elements.

4. A device as claimed in claim **2**, wherein there are two annular chambers, and the means comprise toroidal sealing elements arranged at different distances from the median plane of the plate to be deformed.

5. A device as claimed in claim **1**, wherein the annular sealing supports are supported on a base plate, and the stiffness of the base plate is a function of the stiffness of the plate to be deformed.

6. The method of producing a predetermined aspherical optical surface by pneumatic action on both sides of a planar or spherical optical element, which comprises working one entire surface of said element in the normal manner, while selectively deforming said element in a central and at least one annular area by vacuum, to different degrees, and after surfacing and polishing said one face of said element, turning said element over and working the entire other surface of said element in the normal way while again selectively deforming said element in a central and at least one annular area by vacuum to different degrees.

7. A method for producing aspherical optical elements comprising the steps of supporting a plate element to be deformed on at least one circular support, the portion within the support defining a first portion and the portion outside the support defining a second portion reducing the pressure over the first portion and the second portion independently of one another and to different degrees thereby deforming the plate, and then surfacing the deformed element on one face and then the other.

8. A method as claimed in claim **6**, wherein the faces of the element are finished with polishing tools such that each face has a different profile.

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